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DDA 81-0930

01 MAY 1981

MEMORANDUM FOR: Chief, Information Management Staff, DO

FROM: [REDACTED]
Information Handling Systems Architect, DDA

SUBJECT: CRAFT System Architecture

REFERENCES: A. "Some Questions and Answers on CRAFT,"
dated 15 April 1981

B. Note for [REDACTED]
[REDACTED] dated 13 February 1981

1. Your forwarding of reference A helps greatly to clarify for me your perspective on CRAFT. Even though we have been talking extensively about the subject, I do not believe we have adequately focused on the key issues in a way that supports their resolution. It now seems to be my turn to attempt to do that. [REDACTED]

2. As I see it, there are four key issues. They are, with their deductions:

- I. Objectives: When specifically addressed, point to a different CRAFT than has been conceived by IMS.
- II. Development: Significant development is required and the project should be configured to support it.
- III. Environment: A processing environment with powerful system software and utilities and significant capability growth potential is required. A simple BASIC-based system does not meet this need. Commonality with the NIEPS is also probably required.

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IV. Acquisition Strategy: The current CRAFT project configuration is for an interim system. Consideration of the first three issues leads to the conclusion that the effort should be more towards a full capability system from the start. [REDACTED]

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3. These issues are discussed in the following paragraphs.

I. The Objectives of CRAFT

It seems to me the "Why" of CRAFT--the objectives to be achieved through the investment of [REDACTED] plus in this system--needs to be examined. Ultimately, these objectives will determine the form, schedule, sizing and phasing of CRAFT. [REDACTED]

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For direct support of the DDO there seems to be two objectives:

°Adequate volatility of the records.

°Improved office efficiency.

The first was specifically posited in the reference paper in terms of [REDACTED] capability; the second was inferred from the discussion of word processing functionalities to be provided. [REDACTED]

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Office efficiency will be improved by word processing, but this is not a big factor. As I understand it, case officers now type their own reports and cables on standard typewriters. In an automated office environment they still would type their material. What is eliminated is the need for further retyping of the reports and cables for editing and transmission. The result is a reduction in the need for support staff--mostly secretaries. Say instead of one secretary for four people, there is then one for eight. Thus,

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if a station had eight Agency case officers and two secretaries it now could have nine and one secretary, assuming constant staffing. Smaller stations with but a single secretary, might be able to trade the secretarial function for another case officer through the improved efficiency, but might not choose to do so for other reasons. The general impact does not seem to be great. While putting a greater portion of the Agency's personnel resources into those that execute the primary functions is desirable, I have not heard that modest increases in this factor is a high priority objective. If it were, a more direct, and far cheaper route seems to be available in the environment of the new administration. [redacted]

Thus, the need for a standard, "garden variety" office automation system seems to have a low priority. It certainly [redacted]

There are, however, other uses and applications for CRAFT. I think they are vague at this point, because as I pointed out before, the necessary requirements definition has not been done. Let me speculate on what a few of these are or might be:

- °Support of Logistics Agency Standard Automated Property Government System (ASAPS).
- °Support of a Logistics requisitioning system, developed within the LIMS framework.
- °Support Finance's new Field Accounting and Budgeting (FAB) system.
- °Support management functions for Communications, OSO and OTS.

2. °Support analysis functions for NFAC. [redacted]

Each of these applications with the exception of the NFAC one, also contributes to office efficiency. They have the capability of not only reducing support staff requirements, but also professional staff in support areas. While the priority does not seem high for any of these efficiency improvements considered singly, taken together, they provide a significant potential for improved personnel resource utilization at larger stations. Thus, their sum may have a higher priority. Even so, I think it is moot whether the priority of the personnel resource utilization improvement justifies the [redacted] investment of [redacted]

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There are, however, two objectives which seem to me to fully justify CRAFT. They are to provide:

- °A robust Agency field station operations capability. 25X1
- °Commonality with and support of the NIEPS program. [REDACTED]

Right now, our electronic field support "system" is extremely fragile and the extant plan for CRAFT does not change that. Essentially, the presumption is made that the Agency is needed to function abroad only in times of peace. This assumption is made because in times of heightened tension, local fighting involving our military, or boarder war, the data communications needed to support other than basic operations could not be expected to exist. The current word processing system concept for CRAFT is heavily dependent on Headquarters processing and files. While planned use of these capabilities is well worthwhile to enhance the peacetime effectiveness of foreign status, a lack of degraded-mode, local processing capability seems to me to constitute a major deficiency in meeting the Agency's operational responsibilities. A robust CRAFT architecture, providing powerful local capabilities, I believe to be a high priority objective. [REDACTED] 25X1

The second objective involves the ability to provide a common environment for some of the NIEPS applications packages. There should not be any conversion problem between CRAFT and NIEPS processing systems. Each applications package from either the CRAFT or NIEPS environment should run in both--without any significant operational or structural variation. I believe providing this commonality greatly reinforces the payoff of each of these programs and reduces the combined costs significantly. In fact, I question whether we can afford to do otherwise. [REDACTED] 25X1

II. Development Requirements

As I pointed out in reference B, the requirements/specifications for CRAFT need to be developed and validated before decisions are made concerning equipment or commitments made relevant thereto. Although a lot of work has been done in defining how CRAFT should support the DDO, such system requirements/specifications have not been developed and validated. [REDACTED] 25X1

In developing such requirements, the burden is on CRAFT. Potential users will have their applications projects at a variety of stages of development. It is up to the CRAFT project to develop the needed definitional data relevant to each, and to integrate them into a coherent whole. Full support for this effort can be

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expected from the various user offices. As you know, I have offered the services of my office to assure whatever coordinated support you may need. So far, I am not aware of any call for a coordinated requirements development effort. [REDACTED]

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The statement of reference A that CRAFT does not involve development is hard to understand. To begin with, there are the interfaces to the existing communications system. These are unique and will require development efforts. In addition, there is the problem that in many [REDACTED] environments the CRAFT center, located [REDACTED] area, and the communications center are physically displaced. A separate secure link will have to be developed for such facilities in order to provide the planned communications facility in CRAFT. [REDACTED]

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No matter who uses the system, proper security procedures and safeguards will have to be built into the systems OS. While most automated office systems offer a password system, it should not be taken for granted that these simple systems will meet our security requirements. A more elaborate access control and verification may well be required. In addition, encryption of all data in electronic files is also a likely requirement, and this too will require development. [REDACTED]

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The largest portion of the development effort will probably be for the applications packages. Clearly, substantial development is involved in deploying such an array of functionalities in the CRAFT environment as mentioned in the preceding section. Even if the developments of all of them were supported by other activities, there would still have to be substantial investment in providing this environment for them. Involved in that environment development are transactions handling, communications, data base management, and security processes. The interfaces to that environment have to be specified and controlled for all the non-CRAFT developments which are to be supported by it. [REDACTED]

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III. The CRAFT Environment

The CRAFT has to provide all the facilities of an office automation system plus support such applications as have been discussed. Such a requirement correlates with at least a mini-computer-based processing capability. Given the requirement for maintenance by OC personnel, it also correlates with a built-in-test (BIT), continuously running in the background, and diagnostic software. [REDACTED]

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25X1 The software system should utilize a powerful OS, supported by capable DBMS and word processing/editing packages. All the software should be written in a common higher order language (HOL). Use of a common HOL reduces maintenance requirements, facilitates enhancement of the applications packages, and facilitates the inevitable conversion when more powerful processing machinery is ultimately required. [REDACTED]

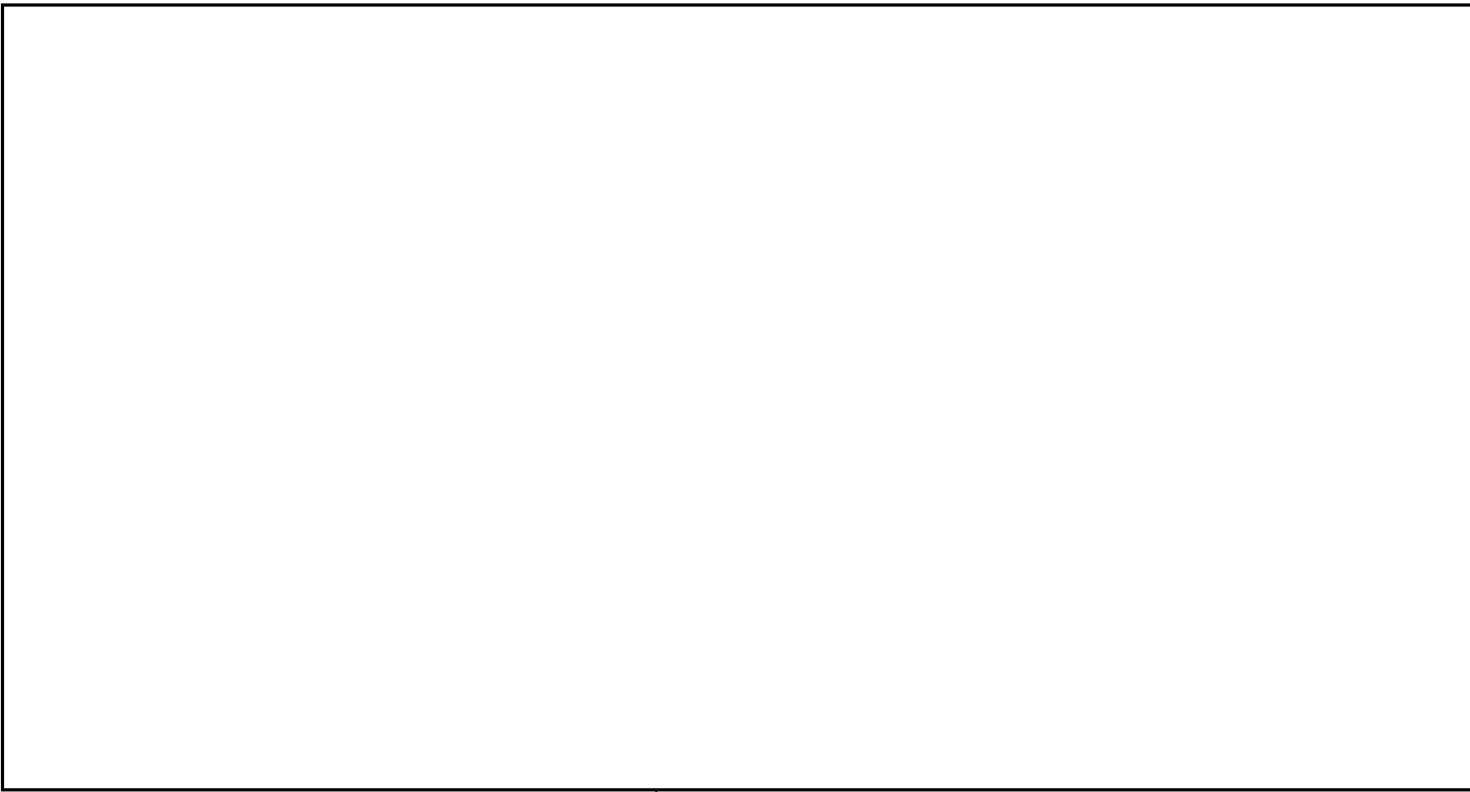
25X1 As you have indicated, CRAFT has to be a highly secure system. It may be found appropriate to encrypt all data stored on electronic media to further enhance security. At a minimum, such encryption needs to be evaluated with respect to feasibility/practicality. I think the consensus will be, if it is feasible and practical, do it. Such encryption will doubtlessly involve some special systems software development. In addition, there should be the types of access control we normally apply in our other systems today: terminal access, user system access, and user data access. [REDACTED]

25X1 My understanding is that IMS is now inclined very strongly [REDACTED] As you are aware, this system is a very capable office automation system; but that is all. It is 25X1 designed to support office automation, with no excess functionality. The system only supports BASIC, and it is a partially interpreted BASIC. Because it is interpreted, it has to be significantly slower than a compiled language. [REDACTED]

25X1 The file management system (DBMS) offers a unique, powerful and very efficient pointer system of very limited functional scope. It supports only the Boolean "and," and cannot deal with other Boolean commands or multiple words in context, such as "Space Shuttle." As a consequence, it works well against record header data, but is of doubtful value on text. The logic of the file management system design is such that [REDACTED] upgrades to solve these problems are not trivial, and may not be practical. In short, it is a relatively simple system with limited enhancement capability. [REDACTED] 25X1

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If we were to acquire this system we would have very limited capability to support applications packages. Furthermore, we would have to write all such applications packages in BASIC. As you may know the applications group in ODP prohibits the use of BASIC in any applications development. I fully support that position and will strongly oppose a requirement for the use of BASIC in the development of applications packages in other system environments. BASIC is computationally inefficient (except, possibly, where it is fully compiled), does not lend itself to structured code, is difficult to maintain and enhance, and is impossibly expensive to convert. It is also a non-standardized language that is different on each marque of machine upon which it is hosted. [REDACTED] 25X1



25X1 An additional key aspect of the CRAFT environment is likely to be a requirement for commonality with the NIEPS program. Such a commonality would also necessitate the use of powerful OS, DBMS and word processing/editing functionalities. Additionally, the support of common HOLs would also be required in order to have transportability of the applications packages. In fact, the processors for CRAFT should probably be of the same make as those for NIEPS.

IV. Acquisition Strategy

Basically, there seem to be two possible acquisition strategies:

- (1) Procure an interim CRAFT using an off-the-shelf system to meet the immediate automated office needs of the DDO, and then replace or upgrade two or three years later when the applications packages become available.
- (2) Proceed to develop the CRAFT capability defined by a full set of requirements, including in all probability commonality with the NIEPS program. IOC would be several years later than for the first option.

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Implicit in the first is, I believe, the assumption that we will spend about [] to get the interim CRAFT and then about [] to get the full CRAFT. In the second, we proceed immediately to procure [] CRAFT, recognizing that IOC will be two or three years later than in the first option. The second option does not imply that the full capability of CRAFT will be available at IOC. The initial implementation could provide a secure automated office system for the DDO plus perhaps a few other applications packages such as ASAPS. The rest could follow as development resources permit. []

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I have to say that I do not personally endorse interim systems except where there is a high priority. They cost almost as much as the full systems, and the limited operational life they usually have makes them very expensive indeed. Furthermore, I have serious doubts that the Congress will fund two CRAFTs with those sorts of price tags. []

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The only justification for the first option that I can see would be a very high priority associated with the automated office function. As discussed in the first section, however, the priority for this objective appears to be low. []

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An alternative that has been mentioned that might make the first option more palatable would be to bring the interim CRAFT system back to Headquarters when the full CRAFT is fielded. This would provide a longer useful life for this investment. The trouble with this approach is that there would have to be a major additional investment at that point to provide the needed interfaces to the central systems. By the time that the interim CRAFT equipment were available to be returned, we would already have our Agency standard word processing system in the Washington area. It is anticipated to be a much more powerful facility [] and thus the willingness of users to accept such a dated functionality is highly questionable. Return of an office automation system such [] does not appear practical at this juncture. []

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If the second acquisition strategy is accepted, the issue of commonality of the CRAFT and NIEPS programs will need to be examined thoroughly. At the current state of development of these two projects there seems to be great value in having the CRAFT provide commonality with the data processing aspects of the NIEPS. The benefits are facile interoperation and mutual support, security (the CRAFT program may be able to provide cover for the data processing section of the NIEPS) and acquisition cost. []

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25X1 4. The foregoing discussion is primarily relevant to the [redacted] largest installations. The CRAFT assumption that the smaller ones "follow along" is one of the issues that needs to be more thoroughly explored. It may be that their needs are sufficiently different that a "reduced" configuration of the larger installations is not appropriate. Simply providing a basic, off-the-shelf word processing facility with file management and communications functionalities may be more cost effective. Such a reduced capability should probably have a degraded mode link back to a regional center, however, should the Headquarters link be lost. [redacted]

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5. To avoid misunderstanding, let me say that it is clear that office automation for field status is highly desirable--it simply does not seem to be worth anything like [redacted]. The same is true for employment of certain support, management and analysis applications packages. I believe it is the provision of robustness and NIEPS commonality that makes the whole thing add up to a worthwhile, justifiable and defensible program. CRAFT has the Hill identity of encompassing everything we need to do in field stations. That is the flag under which we have to do it. If we decide to do other lesser things, I think they should be done under lesser banners, not usurp the CRAFT identity. Otherwise, I think we will get ourselves into a real budget corner. [redacted]

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25X1 6. Also in the foregoing, I have tried to focus on the essence of the issues, as I perceive them. There are obviously ramifications of most of these points, but I believe of a secondary nature. If you find or believe from your expert knowledge of the environment that some of these are not secondary and will drive these conclusions in different directions, please let me know. [redacted]

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cc: DDA
DDO
DCI/NIEPS

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25X1 DDA/IHSA: [redacted] (01 May 1981)

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REMARKS

Ed - I can't remember whether you have seen this. Should have.

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OPTIONAL FORM 41 (Rev. 7-76)

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15 April 1981

SOME QUESTIONS AND ANSWERS ON CRAFT

WHAT IS CRAFT?

A program to provide computer and word processing capabilities to the overseas field stations of the Directorate of Operations, enabling our officers to conduct their business abroad with far less paperwork, in a more secure record-keeping environment.

WHY IS IT IMPORTANT?

In recent years a surge of terrorist activity has highlighted the vulnerability of our overseas stations to attack. By replacing paper files with electronic files, CRAFT will enable a station to destroy its records rapidly in an emergency and to reconstitute them efficiently, to the extent needed, after a crisis has passed. In normal circumstances, CRAFT will dramatically reduce the amount of time that the field officer must spend handling correspondence and searching station files for needed information.

WILL CRAFT BE A LARGE EFFORT?

Yes. CRAFT, in the aggregate, will be a large, complex program. At the field station level, however, we are talking about small office automation systems. The program will encompass a large number of these small "stand-alone" systems -- deployed independently and incrementally to the stations. The provision of systems to all ☐ overseas field stations is a goal, but the extent of the program will very much depend on the success of our early installations.

HOW DID CRAFT ORIGINATE?

In January 1977 the DDO approved a recommendation to pursue the phased deployment of CRAFT systems over a ten year period. Work was begun. Faced, however, with a significant increase in station "burn-outs", as a result of terrorist attacks and unstable political conditions, the DDO in late 1979 directed that a more aggressive

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plan for the deployment of systems be prepared. An inter-directorate task force drew up such a plan, with cost estimates, in early 1980.

MUST FIELD STATIONS MAINTAIN LARGE RECORDS COLLECTIONS?

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any?
any?

No official records are maintained abroad. These are all kept at Headquarters, providing the basis for reconstitution of field files. Information held in the field is either duplicative or considered expendable. During the past two years the Directorate has drastically reduced field station holdings in accordance with a "minimum-paper" policy. In addition, the expanded use of micrographics in place of paper has been successfully encouraged -- reducing destruction time even further. It has been found that a station can operate effectively with of historical records. In fact, experience has shown that a station, if need be, can operate without any records at all. CRAFT will complement the field records reduction program by allowing essential information to be conveniently maintained in readily destroyable electronic form.

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HOW HAVE REQUIREMENTS FOR CRAFT DEVELOPED?

The CRAFT idea originated in the early 1970's, before the "paperless office of the future" concept became popular, and before available technology could sustain that concept on a realistic basis. Since then, discussion of the idea has involved a wide range of CIA employees. The Directorate's Information Management Staff (IMS), which is responsible for orchestrating all aspects of the Directorate's communication and information-retention systems, has recently concluded a series of in-depth interviews which will support the formalization of a system definition paper in May 1981.

HAVE OTHER DIRECTORATES BEEN INVOLVED?

Everyone recognizes that CRAFT will affect more than one Directorate. It will provide administrative as well as operational support, and for that reason is important to DDA offices. Financial, personnel, logistics and security applications will be placed on the field computers. The interrelationship with staff communications will involve OC. Security aspects will involve both OC and OS. Hardware procurement will involve ODP and OL. These offices have all participated in CRAFT working group discussions from the start. All had representatives on the task force which drafted the 1980 CRAFT acceleration plan. ODP helped with the testbed specifications.

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WHAT ABOUT NFAC? WILL CRAFT SUPPORT INTELLIGENCE ANALYSIS OVERSEAS?

Unless they are assigned as Station officers, NFAC personnel will not use CRAFT. CRAFT is not intended to support intelligence analysis. It is being designed for the use of operations officers, station administrators, and secretaries -- to streamline their work so that the station as a whole can concentrate its efforts on the business of recruiting and handling agents.

WHAT HAS BEEN ACCOMPLISHED THUS FAR?

During the past three years a System Development Center has been established at Headquarters and two prototype systems have been deployed within the U.S. A system was installed at a small overseas station in early 1981. Funds are currently being sought for the installation of a system at a large overseas station this year.

HAS IT BEEN DIFFICULT TO ACQUIRE RESOURCES?

Yes. This is what has delayed the program. No funds at all were provided for FY 1981 and only [] (without positions) has been budgeted for FY 1982--the accelerated plan notwithstanding. The prototypes have all been installed using re-programmed funds and manpower drawn from other activities within the Directorate. 25X1

WHAT WILL CRAFT COST? 25X1

HOW WILL CRAFT RELATE TO THE CIA COMMUNICATIONS SYSTEM?

CRAFT will permit messages typed by a station on its word processing equipment to be sent to Headquarters without any re-typing for communications purposes. Messages received by a station will be fed directly into its CRAFT storage facilities.

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IF A STATION'S COMMUNICATIONS SYSTEM GOES DOWN WILL IT LOSE CRAFT ALSO?

No. A station will not have to depend upon functioning communications facilities to gain access to its CRAFT files. For some time, at least, CRAFT will concentrate on strictly local storage and retrieval of a station's electronic records, in "stand-alone" mode. More intricate relationships with CIA's international communications system, for "long-distance" storage and retrieval, will evolve gradually as that system is upgraded in anticipation of CRAFT and other needs. In the future, we may seek to remove all sensitive information from certain high-risk field locations and to provide them real-time access to Headquarters files, accepting a dependence upon communications facilities in such cases.

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WILL CRAFT INVOLVE R&D?

No. Hardware will be strictly "off-the-shelf" standard office automation equipment -- microcomputers which can handle both word and data processing and at the same time connect to communications facilities. For this reason, it is imperative that a forward-looking company with proven reliability and viability be selected to provide a family of equipment which can be deployed to stations on a modular basis, depending on a station's size. TEMPEST-approved equipment is mandatory, increasing equipment cost and diminishing the availability of choice.

WILL DATA ENCRYPTION BE EMPLOYED?

When the technology to totally encrypt all information electronically stored in the field is fully developed, that technology will be employed. Until then, the only encryption that will exist will be in the communications lines which locally interconnect remote terminals, when a station (including its communications facility) does not enjoy contiguous space.

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HOW WILL EQUIPMENT BE MAINTAINED IN THE FIELD?

CRAFT will stand or fall on the basis of equipment reliability. There will be a duplicate system at each station for backup. Simple maintenance will be provided by field officers themselves. Spare parts will be stockpiled locally. More complex "in-house" maintenance will be handled by Office of Communications personnel. The hardware manufacturer will be required to provide rapid assistance, as needed, to replenish spare parts, replace units, and repair equipment returned from the field.

WHAT SOFTWARE DEVELOPMENT WILL BE INVOLVED?

I don't believe this! {
No programming will be done in the field. Stations will be provided all applications software by Headquarters, in modular packages to suit each station's need. Many applications will use software available with the equipment. The remaining applications will not require significant development effort. The most complex systems for operational use have, in fact, already been developed by IMS. Our testbeds have proven that the real CRAFT challenges do not lie in software development, but rather in large-scale procurement, site preparation, training, and maintenance.

WILL THE HELP OF CONTRACTORS BE REQUIRED?

Certainly not for software development. But such assistance would be welcomed if we cannot hire the help we need for hardware maintenance abroad, which looms as the most difficult challenge facing CRAFT.

WHAT IS PLANNED BEYOND THE 1980's?

We do not expect basic functional requirements to change. Increased use of staff communications facilities and data encryption will affect CRAFT considerably as this decade draws to a close. Office automation technology is improving at a brisk pace. We expect equipment to become available in the latter part of the decade that we will want to take advantage of in the 1990's. However, we hope to pick a manufacturer now with whom we can move into the 1990's with minimum conversion and re-training effort.

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